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Is Laxative Misuse Associated with Binge Eating? Examination of Laxative Misuse among Individuals Seeking Treatment for Eating Disorders

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Abstract

Objective—Our research focuses on laxative misuse, which has been understudied in previous eating disorders (ED) research, in order to understand its prevalence and correlates among individuals seeking ED treatment. We also test the association between laxative misuse and binge eating in order to examine the assumption that laxative misuse is intended to compensate for binge eating.

Method—Participants were 2,295 ED treatment-seeking adults (29.5±10.5) who self-reported their disordered eating behaviors on the Eating Disorder Questionnaire. Participants met DSM-5 diagnostic criteria for anorexia nervosa (AN:11.5%, n=264), bulimia nervosa (BN:39.0%, n=896), binge eating disorder (14.9%, n=343), or other specified feeding or eating disorder (34.5%, n=792).

Results—Nearly 25% of participants (n=571) reported misusing laxatives during the last month. Laxative misusers with AN reported significantly higher frequency of laxative misuse relative to misusers with BN ($F(1,440)=5.226$, p=.023, $\eta_p^2=.012$). Among laxative misusers, there was no association between frequency of binge eating and frequency of laxative misuse.

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Discussion—Laxative misusers with AN tend to misuse laxatives more frequently than those with BN. Binge eating was not related to laxative misuse in our sample. Future research may use real-time data collection to understand the function of laxative misuse and to validate our cross-sectional findings.

Keywords

Laxative misuse; Binge eating; Anorexia nervosa; Bulimia nervosa

Laxative misuse (i.e., intentionally using laxatives to control weight) is common among individuals with eating disorders (ED; Bruce et al., 2003; Bryant-Waugh et al., 2006; Kovacs & Palmer, 2004; Roerig et al., 2010; Steffen et al., 2007; Tozzi et al., 2006). Laxative misuse is associated with more severe eating-related psychopathology, poorer treatment outcome, and lower retention rates among individuals with ED (Bryant-Waugh et al., 2006), as well as significant medical risks (e.g., dehydration, electrolyte and acid/base changes; hypokalemia; lazy bowel syndrome; gastrointestinal problems; Roerig et al., 2010) and psychological comorbidities (e.g., depression, negative self-esteem, body image disturbances; Tozzi et al., 2006). Despite these complications, laxative misuse has received relatively little attention in the ED literature. Furthermore, existing research on laxative misuse has mainly focused on individuals with bulimia nervosa (BN) while data on laxative misuse among individuals with anorexia nervosa (AN) are relatively scarce. Therefore, the prevalence and correlates of laxative misuse require further study.

Studies examining lifetime occurrence of laxative misuse suggest that it may occur in up to 5% in the general population (Phelps et al., 1993), but estimates among ED samples are much higher (4%-35% in AN and 11%-63% in BN; Bruce et al., 2003; Kovacs & Palmer, 2004). Estimating rates of laxative misuse is complicated as different studies have used different criteria to define laxative misuse, including the month before assessment (Kovacs & Palmer, 2004), the three months before assessment (Bryant-Waugh et al., 2006), or any past misuse (Tozzi et al., 2006). Furthermore, while several studies have examined the prevalence of laxative misuse, few have attempted to understand the frequency of the misuse. It is important better understand frequency of misuse as individuals who misuse laxatives more often may be at higher risks for medical complications (Roerig et al., 2010).

The trans-diagnostic cognitive-behavioral model for ED (Murphy et al., 2010) suggests a temporal link between binge eating and compensatory behaviors. The underlying assumption is that individuals with ED tend to use compensatory behaviors after binge eating to counteract the effects of overeating. Although some studies suggest that self-induced vomiting is not always preceded by binge-eating episodes (Berg et al., 2013), most of the existing literature provides scientific support for the temporal link between binge eating and self-induced vomiting using cross-sectional data (Masheb et al., 2011) and ecological momentary assessment (Haedt-Matt & Keel, 2011; Smyth et al., 2009). By contrast, little is known about the link between binge eating and laxative misuse. Furthermore, while some early data suggest that laxative misuse may not be linked with binge eating among individuals with BN (Mitchell et al., 1991), to the best of our

knowledge, recent data have not been able to elucidate the pathway between binge eating and laxative misuse across diagnoses.

The primary purpose of the current study is to clarify the occurrence and correlates of laxative misuse. The specific research questions are: (1) What are the rates of current laxative misuse among ED treatment-seeking adults? (2) Is binge eating linked with laxative misuse among ED treatment-seeking adults who misused laxatives during the last month? Given that the ED literature tends to link laxative misuse to diuretic misuse (Murphy et al., 2010), a secondary aim was to examine occurrence and correlates of diuretic misuse. Additionally, given that previous studies have mostly supported the existence of the link between binge eating and self-induced vomiting (Masheb et al., 2011), we will examine the link between binge eating and laxative misuse in comparison to the link between binge eating and self-induced vomiting.

Method

Participants

Participants were 2,295 ED treatment-seeking adults aged 16 to 75 years (mean age=29.45±10.49) comprised of two groups: those who misused laxatives once or more during the last month (24.9%, *n*=571), and those who denied misusing laxatives during the last month (75.1%, *n*=1,724). Participants were classified as having DSM-5 AN (11.5%, *n*=264), BN (39.0%, *n*=896), binge eating disorder (14.9%, *n*=343), or Other Specified Feeding or Eating Disorders (OSFED: 34.5%, *n*=792). Among participants with AN, 45% (*n*=119) were of the binge eating/purging type (AN-BE/P) and the rest were restricting AN (AN-R).

Procedures

Data were collected at four outpatient specialty ED treatment centers (Neuropsychiatric Research Institute, Fargo, ND; Department of Psychiatry and Behavioral Neuroscience, The University of Chicago, Chicago, IL; Department of Psychiatry, University of Minnesota School of Medicine, Minneapolis, MN; and the Center for Eating Disorders and Psychotherapy, Worthington, OH). Data were collected by self-report prior to the baseline assessment. Approximately 90% of clinic cases presented with the questionnaire provided informed consent to participate in the study. Each data collection site received Institutional Review Board approval for the study. Data were collected between 1980 and 2004.

Measures

Participants self-reported their current height and weight, and current and past ED symptoms on the Eating Disorder Questionnaire (EDQ; Mitchell, 2005). Four EDQ items were of interest for the current study: "*During the entire LAST MONTH, what is the average frequency that you have engaged in the following behaviors? (1) Binge eating; (2) vomiting; (3) laxative use to control weight; (4) use of diuretics*". Response options ranged from 1 ("*never*") to 8 ("*more than once a day*").

Although the EDQ was not designed as a diagnostic instrument, DSM-5 criteria were used to generate diagnoses (e.g., Body Mass Index [BMI] ≤17.5 for AN, binge eating and compensatory behaviors ≥1 time per week for BN, absence of use of compensatory behaviors for binge eating disorder) as described by Mitchell and colleagues (2007). EDQ-generated ED diagnoses show relatively good agreement with those derived from a semi-structured interview (Eddy et al., 2009).

Statistical Analysis

Data were analyzed using SPSS 23.0. Analyses of variance (ANOVAs), χ^2 analyses, and Pearson's correlations were used to assess relationships between background characteristic and laxative misuse. We were interested in examining if binge eating is associated with purging among adults whose binge-eating frequency ranges from zero to several times a day. Therefore, Pearson's correlations were computed separately for participants who reported (1) laxative misuse (n=571), (2) diuretic misuse (n=220), (3) self-induced vomiting (n=1,142), (4) laxative misuse and binge eating (n=490), (5) diuretic misuse and binge eating (n=180), (6) self-induced vomiting and binge eating (n=1,044) during the last month.

Results

Table 1 shows that one-quarter (n=571) of participants misused laxatives once or more during the last month [AN: 30% (n=81); BN: 40% (n=361); $\chi^2(1,1160)=7.98$, p=.005, $\eta_p^2=.007$]. Misusing laxatives once a day or more was reported by 38% (n=31) of laxative misusers with AN relative to 22% (n=80) of laxative misusers with BN ($\chi^2(1,332)=9.13$, p =.003, $\eta_p^2=.020$). A total of 63% (n=75) of participants with AN-BE/P misused laxatives once or more during the last month.

Table 2 shows that frequency of laxative misuse was significantly higher ($F(1,440)=5.226$, p=.023, $\eta_p^2=.012$) among laxative misusers with AN (AN: 5.35±2.1; AN-BE/P: 5.56±2.1) relative to BN (4.80±1.9). Frequency of laxative misuse was not correlated with binge eating among participants with laxative misuse [AN (n=81):r=.169, p=.13; BN (n=361):r=.046, p=.38; entire sample (n=558):r=−.002, p=.959]. Among participants with laxative misuse and binge eating, the correlation was of marginal significance with a very small effect size [AN (n=53):r=−.031, p=.83; BN (n=361):r=.046, p=.38; entire sample (n=490):r=.089, p=.049]. On the contrary, frequency of self-induced vomiting was correlated with binge eating among participants with self-induced vomiting [AN (n=113):r=.582, p<0.001; BN (n=799):r=.543, p<0.001; entire sample (n=1,130):r=.543, p<0.001], as well as among participants with self-induced vomiting and binge eating [AN (n=88):r=.711, p<0.001; BN (n=799):r=.543, p<0.001; entire sample (n=1044):r=.599, p<0.001)].

Discussion

Laxative misuse is a harmful behavior among individuals with ED (Roerig et al., 2010). Our multi-site data revealed several interesting findings regarding laxative misuse among adults seeking ED treatment. First, as many as one-fourth of our sample misused laxatives during the month prior to the assessment, which is consistent with previous reports (Steffen et al.,

2007). Second, although the effect size was small, frequency of laxative misuse was significantly higher among laxative misusers with AN relative to misusers with BN. Third, although our data are cross-sectional and cannot be interpreted as reflecting of causation, our findings suggest that binge eating was not associated with frequency of laxative misuse among ED treatment-seeking adults. This finding is consistent with Berg et al. (2013), but may contradict the trans-diagnostic cognitive-behavioral model of ED (Murphy et al., 2010). Additional research using prospective, momentary designs (e.g., ecological momentary assessment) is needed to capture the proximal association between eating behaviors and the misuse of laxatives in individuals with ED.

Although laxative misuse was less common among adults with AN relative to adults with BN, our data suggested that laxative misusers with AN, particularly AN-BE/P, tend to misuse laxatives more frequently than those with BN. Given that most individuals with AN do not engage in frequent binge-eating episodes (Elran-Barak et al., 2014), reasons other than counteracting the effect of binge eating should be considered in determining causes for laxative misuse in AN (e.g., distress about shape/weight; self-harm). Additionally, the high frequency of laxative misuse observed among individuals with AN is worrisome, given that individuals who misuse laxatives more often may be at a higher risk for medical complications (e.g., dehydration, electrolyte imbalance; Kovacs & Palmer, 2004) and may have more difficulties withdrawing from the misuse because of physical and psychological dependencies (Wald, 2003).

The current study tested the hypothesis that laxative misuse is associated with binge eating. Our cross-sectional data did not support this hypothesis. Although binge eating, vomiting, and laxative misuse, are a cluster of behaviors that tend to co-occur, frequency of binge eating and vomiting were linked with each other, while frequency of binge eating and laxative misuse were not. Thus, the potential function of laxative misuse and self-induced vomiting as compensatory behaviors may differ. It may be that factors unrelated to binge eating (e.g., behavioral impulsivity, mood changes; Tozzi et al., 2006) tend to impact laxative misuse among adults with ED.

To our knowledge, this study is the first to directly assess the relationship between binge eating and laxatives misuse among individuals seeking treatment for ED. Study strengths include the large sample size and the uniform data collection from five separate treatment sites in different geographic locations. Several limitations should be noted. First, the use of cross-sectional data for this particular study did not inform our understanding of the temporal order of binge eating and laxative misuse. Second, our study did not assess for other factors (e.g., negative affect) that may lead to binge eating and compensatory behaviors including laxative misuse. Third, height, weight, and eating-related psychopathology were assessed by self-report questionnaire which does not address the possibility of participants providing inaccurate data by over- or under-reporting. Nevertheless, individuals with ED tend to provide accurate self-reported data (Connor Gorber et al., 2012). Furthermore, self-reported data of secretive behaviors, such as laxative misuse, may be more accurate relative to in-person interviews (Mintz et al., 1997). Fourth, our study did not asses for types of laxatives (e.g., stimulant type laxatives, stool softeners), and some may be more harmful than others (Steffen et al., 2007). Fifth, single month

assessment of laxative misuse may not be representative of the months before assessment. Sixth, information was unavailable regarding the amount of food consumed which may influence the choice of the specific compensatory behavior. Seventh, the heterogeneous OSFED group was not broken down into sub-categories (including purging disorder). Finally, the study population consisted of adults who presented for ED treatment, which limits generalization to adolescents and non-treatment-seeking samples.

This study showed that individuals seeking treatment for ED report misusing laxatives at high rates. We also demonstrated that in contrast to self-induced vomiting, laxative and diuretic misuse are not linked with binge eating. Clinicians who work with ED patients are encouraged to carefully assess for laxative and diuretic misuse, while keeping in mind that these behaviors are often carried out in secret and many patients are hesitant to share information about their misuse, or about the severity of their misuse (Becker et al., 2005). Clinicians are also encouraged to assess the temporal order of binge eating and the misuse of laxatives and diuretics prior to assuming that all types of compensatory behaviors follow binge-eating episodes.

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Table 1

Sample characteristics by frequency of laxative misuse during the last month.

	Report Any Laxative Misuse[1] *n*=571	Did not Report Laxative Misuse[1] *n*=1724	Total Sample *n*=2295	Test Statistics[2]
Demographics				
Age (years)	27.2±8.8	30.2±10.9	29.5±10.5	$F(1,2293) = 35.5$, $p < .001$, $\eta_p^2 = .015$
% female	97.9% (*n*=558)	91.5% (*n*=1575)	93.1% (*n*=2133)	$\chi^2(1,2292) = 27.4$, $p < .001$, $\eta_p^2 = .012$
% Caucasian	89.7% (*n*=505)	91.3% (*n*=1550)	90.9% (*n*=2055)	$\chi^2(1,2261) = 0.9$, $p = .321$, $\eta_p^2 = .001$
Weight				
Body mass index (BMI; kg/m[2])	22.4±6.0	29.3±13.1	27.6±12.1	$F(1,2293) = 150.3$, $p < .001$, $\eta_p^2 = .062$
Weight status				$\chi^2(3,2295) = 164.6$, $p < .001$, $\eta_p^2 = .072$
Underweight (BMI<18)	18.4% (*n*=105)	13.6% (*n*=234)	14.8% (*n*=339)	
Normal weight (18≤BMI<25)	62.9% (*n*=359)	44.0% (*n*=758)	48.7% (*n*=1117)	
Overweight (25≤BMI<30)	10.7% (*n*=61)	6.4% (*n*=110)	7.5% (*n*=171)	
Obese (BMI≥30)	8.1% (*n*=46)	36.2% (*n*=622)	29.1% (*n*=668)	
Eating Disorder Diagnosis				$\chi^2(3,2295) = 263.4$, $p < .001$, $\eta_p^2 = .11$
Anorexia nervosa	14.2% (*n*=81)	10.6% (*n*=183)	11.5% (*n*=264)	
Bulimia nervosa	63.2% (*n*=361)	31.0% (*n*=535)	39.0% (*n*=896)	
Binge-eating disorder	0.0% (*n*=0)	19.9% (*n*=343)	14.9% (*n*=343)	
OSFED[4]	22.6% (*n*=129)	38.5% (*n*=663)	34.5% (*n*=792)	
Eating Disorder Related Behaviors[3]				
Binge-eating frequency	5.47±2.4	4.35±2.7	4.63±2.7	$F(1,2254) = 77.7$, $p < .001$, $\eta_p^2 = .033$
Self-induced vomiting frequency	4.59±2.9	3.21±2.9	3.55±2.9	$F(1,2264) = 98.0$, $p < .001$, $\eta_p^2 = .042$
Diuretic misuse frequency	2.02±2.0	1.17±0.9	1.38±1.3	$F(1,2264) = 186.04$, $p < .001$, $\eta_p^2 = .076$

Notes:

[1] During the last month,

[2] Comparisions were conducted between participants who reported any laxative misuse versus no laxative misuse during the last month,

[3]Range = 1 to 8 (1=never; 2=once a month or less; 3=several times a month; 4=once a week; 5=twice a week; 6=three to six times a week; 7=once a day; 8 = more than once a day),

[4]Other Specified Feeding and Eating Disorder.

Table 2

Descriptive information on frequency of binge-eating, laxative misuse, duretic misuse, and self-induced vomiting by diagnosis

	Compensatory-Behavior Frequency[1]				Correlation with Binge-Eating		
	AN	**BN**	**Entire sample**	**Test Statistics**	**AN**	**BN**	**Entire sample**
Laxatives[2]	*n*=81	*n*=361	*n*=571		*n*=81	*n*=361	*n*=571
	5.35±2.1	4.80±1.9	4.75±2.0	$F(1,440)=5.23$, $p=.023$, $\eta_p^2=.012$	$r=-.169$, $p=.13$	$r=.046$, $p=.38$	$r=-.002$, $p=.96$
Diuretics[3]	*n*=22	*n*=138	*n*=220		*n*=22	*n*=138	*n*=220
	5.68±2.3	4.79±2.0	4.91±2.1	$F(1,158)=3.58$, $p=.060$, $\eta_p^2=.022$	$r=.129$, $p=.57$	$r=.024$, $p=.78$	$r=.078$, $p=.26$
Vomiting[4]	*n*=113	*n*=799	*n*=1142		*n*=113	*n*=799	*n*=1142
	5.97±2.1	6.61±1.6	6.07±2.0	$F(1,919)=14.42$, $p<.001$, $\eta_p^2=.016$	$r=.582$, $p<.001$	$r=.543$, $p<.001$	$r=.543$, $p<.001$

Notes: AN=anorexia nervosa; BN=bulimia nervosa

[1] During the last month; Range = 1 to 8 (1=never; 2=once a month or less; 3=several times a month; 4=once a week; 5=twice a week; 6=three to six times a week; 7=once a day; 8 = more than once a day).

[2] Analyeses were conducted among participants who reported misusing laxatives once or more during the past month.

[3] Analyeses were conducted among participants who reported misusing diuretics once or more during the past month.

[4] Analyeses were conducted among participants who reported vomiting once or more during the past month.